XXV.—*On the Parasitism of* Osyris alba.

By Dr. J. E. Planchon*.

In 1847, an English botanist, Mr. Mitten, detected that the roots of *Thesium* adhere by means of suckers to the roots of various plants. A fact like this was very surprising in plants with green leaves; for M. Decaisne had not then made known the similar parasitism of the Rhinanthaceæ. The species of *Thesium* belonging, as is well known, to the family Santalaceæ, analogy would lead to the supposition of a similarly parasitic life in *Osyris alba*, which represents in the south of Europe the most highly developed type of this order. Urged by M. Decaisne, Dr. Planchon sought to verify this presumption; but, for two years, his attempts were vain. The fragile roots of *Osyris alba* leave attached to the nourishing roots the organs of suction which alone could reveal their parasitic character. This year, more fortunate, he has been able to make numerous observations on this subject, the most striking results of which he communicates to the Academy.

Osyris alba lives parasitically upon numerous herbaceous or woody plants (all perennial) belonging to different families of the class Dicotyledons. It implants its suckers upon the roots or the rhizomes which it meets with, not sparing even its own species. *Ailanthus, Rhus Coriaria, Ulmus campestris, Jasminum fruticans, Pinus halepensis, Rosa canina, Silene italica, Lychnis dioica, Rubia peregrina,* all the inhabitants of hedges or copses, are subject to its attacks.

The roots of *Osyris* arise scattered upon the long rhizomes which creep in the soil at a small depth. They consist of slightly branched fibres, the diameter of which does not exceed 2 millimetres. Their organs of suction are a kind of hemispherical or conical cup, the dimensions of which vary from the size of a pin's head to that of an acorn cup. The same radical fibre may furnish one, two, three, or a whole series of cups. These embrace closely with their circumference the nourishing root. They implant themselves there, moreover, by means of a fleshy process or papilla, of cylindrical or discoid form, which penetrates the foreign root, sometimes stopping short in the thickness of the cortical parenchyma, sometimes insinuating itself between the bark and the wood, sometimes, but more rarely, penetrating as far as the ligneous tissue.

The papilla of suction is formed in all cases by a cellular tissue, which is separated into two zones by a sheath of moniliform pitted vessels. The interior is a medullary zone, the exterior the cortical parenchyma. The contact of the papilla with

* Translated from the Comptes Rendus, July 26, 1858.

the tissue of the nourishing root is established by a simple layer of cells forming the inferior surface of the papilla.

Osyris presents, both in its adult rhizomes and its stems, a pith, medullary rays, and bundles of liber-fibres, which are absent from the roots. There is not, however, that difference between the rhizomes and the stems which M. Chatin supposed he found, doubtless because he examined only rhizomes of the year at the commencement of their evolution. The author could find no true tracheæ in these organs. All the wood-cells, as well as those of the medullary parenchyma, are riddled with pits.

The intimate affinity connecting all the Santalaceæ would lead to the supposition that most, if not all, the types of this group, are parasites. The same may be said of the true Olacineæ (*Olax, Ximenia, Heisteria, Liriosma, Opilia,* &c.), which scarcely differ from the Santalaceæ. The black colour assumed by most of these plants on drying, and their absence from gardens, plead in favour of this idea.

Dr. Planchon regrets that he has hitherto been unable to trace the phænomena of germination either in *Osyris* or *Santalum.* This study, which he proposes to make at the proper season, will enable him to settle beyond doubt in what degree these plants are parasitical. Do they take part of their nourishment from the soil? Do all their radical fibres produce suckers? What is the duration of the suckers? A prolonged study is required for the solution of all these questions. It may be stated meanwhile, that the subjects attacked by *Osyris* do not appear to suffer much from its presence, and fulfil as usual the vegetative and reproductive functions.

XXVI.—*On some Sections of the Upper Lias recently exposed at Nailsworth, Gloucestershire.* By John Lycett*.

So few opportunities are afforded for examining the Upper Lias of the Cotteswolds, so small are the artificial exposures of the stage occasionally made, so limited their extent and depth, that its fossils are almost unknown, and even the thickness of the stage has been very variously estimated. During the author's experience of more than twenty years, the Upper Lias has only been known to him by small sections in clay-beds used for brick-making, and these are usually quite destitute of fossils; some cuttings, therefore, recently made, which exposed the entire thickness of the stage and many of its fossils, have induced him to prepare the present brief notice.

* Presented to the Cotteswolds Naturalists' Club, July 21, 1858.